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	EXAMINER
B3M1/1122	

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ART UNIT	PAPER NUMBER
2917	

DATE MAILED: 11/22/96

This is a communication from the examiner In charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☑ This application has been examined   ☐ Responsive to communication filed on_____   ☐ This action is made final.

A shortened statutory period for response to this action is set to expire ___3___ month(s), ___0___ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I   THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☑ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☑ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II   SUMMARY OF ACTION

1. ☑ Claims _____1-26_____ are pending In the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☐ Claims _____ have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☑ Claims _____1-26_____ are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☑ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____ ; filed on _____.

13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

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Part III   DETAILED ACTION

1.   Claims 1-26 are presented for examination.

Specification

2.   The title of the invention is not descriptive.   A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.   Patentability shall not be negatived by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

4.   Claims 1-26 are rejected under 35 U.S.C. § 103 as being
unpatentable over Firoozmand et al, patent no. 5,043,981, in view
of Choudhury et al, patent no. 5,541,912.

5.   As to claims 1 and 10, <u>Firoozmand et al</u> teach the claimed
invention substantially as claimed, including a data processing
['DP'] as claimed, comprising: a plurality of pending queues for
queuing entries of memory or I/O requests generated by processors
to peripheral devices, each of the pending queues includes a
plurality of sub-queues, and a return queuing unit for buffering
data returned from the peripheral devices in response to the I/O
requests [col. 2 line 37 - col. 3 line 17 and col. 7 lines 1-40].

6.   However, Firoozmand et al do not **explicitly** teach the queues
being of variable depth.

7.   <u>Choudhury et al</u> teach a system employing queues of variable
length or dynamic length [abstract and col. 3 line 44 - col. 4
line 36].

8.   It would have been obvious for one skilled in the art at the
time of the invention to combine teachings of Firoozmand et al
and Choudhury et al because Choudhury et al's dynamic length

queues would have increased efficiency and provided improved architecture of Firoozmand et al's system.

9.   As to claims 2-4, 11, and 12, Firoozmand et al teach the variable length return queuing unit comprises one variable length return queue [col. 6 lines 35-50], variable length return queuing unit comprises a plurality of variable length return queues, and each of the plurality of variable length return queues corresponds to each of the processors [col. 2 line 37 - col. 3 line 17].

10.   As to claims 5-7 and 13-15, Firoozmand et al teach each of the plurality of variable length return queues corresponds to each of the peripheral devices, each of the plurality of variable length return queues corresponds to a unique priority level, each of the sub-queues within one of the pending queues is assigned a unique priority level [col. 2 line 37 - col. 3 line 17].

11.   As to claims 8, 9, 16, and 17, Firoozmand et al teach the I/O requests include an address and a priority tag, the address directs the memory or I/O requests to a corresponding one of the pending queues, the priority tag channels the memory or I/O requests to a corresponding one of the sub-queues within the one pending queue, and each of the pending queues comprises a

priority controller for issuing the memory or I/O requests from
the sub-queues in a highest priority first manner [abstract and
col. 7 lines 1-44].

12. As to claims 21-24, Firoozmand et al teach a maximum number
of outstanding memory or I/O transactions is specified for the
unique priority level in each of the sub-queues which prevents
entries of memory or I/O requests having low priority levels from
using one of the sub-queues before entries of memory or I/o
requests having higher priority levels, and priorities
corresponding to the entries of memory or I/O requests are
determined by logical memory addresses, control bits derived from
a memory management page table, control bits derived from
segmentation entries, virtual addresses of a memory management
system, programmable registers which set priorities for each
processor, instructions, or instruction operands [col. 7 line 47
- col. 8 line 54].

13. Claims 18-20, 25, and 26 are the corresponding method claims
of claims 1-17 and 21-24, and therefore, are rejected under the
same rationale.

14. Further references of interest are cited on Form PTO-892
which is an attachment to this office action.

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15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rehana P. Krick, whose telephone number is (703) 305-8476. The examiner can normally be reached Monday through Friday from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas C. Lee, can be reached at (703) 305-9717. The fax phone number for this Group is (703) 308-5359.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-9600.

Rehana P. Krick
November 18, 1996

THOMAS C. LEE
SUPERVISORY PATENT EXAMINER
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